UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

DATE: 11/AUG/2006

SUBJECT: **Fipronil** Acute and Chronic Dietary Exposure Assessments for the Use of Fipronil on Onion Seed, Shallot Seed, and the Tuberous and Corm Vegetables Crop Group 1C.

PC Code: 129121
DP Num: 329350

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Executive Summary

The purpose of this memorandum is to report the results of a dietary exposure analysis for the insecticide fipronil, [5-amino-1-(2,6-dichloro-4-(trifluoromethyl) phenyl)-4-((1,R,S)-trifluoromethyl)sulfinyl)-1-H-pyrazole-3-carbonitrile] for use on onion seed (dry bulb), shallot seed (dry bulb) and the tuberous and corm vegetables crop group 1C based on revised water numbers (D322415, D319940, D328892, J. Hetrick, 26/JUN/2006). The residues of concern and in the tolerance expression for fipronil are fipronil and its 2 metabolites MB45950 (5-amino-

1-(2,6-dichloro-4-(trifluoromethyl)phenyl)-4-[(trifluoromethyl)thio]-1H-pyrazole-3-carbonitrile) and MB46136 (5-amino-1-(2,6-dichloro-4-(trifluoromethyl)phenyl)-4-[(trifluoromethyl)sulfonyl]-1H-pyrazole-3-carbonitrile) and photodegradate MB46513 (5-amino-1-(2,6-dichloro-4-(trifluoromethyl)phenyl]-4-[(1R,S)-(trifluoromethyl)]-1H-pyrazole-3-carbonitrile).

Acute Dietary Exposure Results and Characterization

The Tier 1 acute dietary risk assessment for fipronil shows that for all included food commodities and drinking water, the **acute dietary risk estimates are below the Health Effect Division's (HED's) level of concern (i.e. <100% acute population adjusted doses (aPAD)) for the general U.S. population (9% of the aPAD)** and all population subgroups. The acute dietary risk estimate for the 95th percentile of the highest exposed population subgroup, children 1-2 years, is 25% of the aPAD.

Chronic Dietary Exposure Results and Characterization

The Tier 1 chronic dietary risk assessment for fipronil showed that dietary risk estimates **exceeded HED's level of concern (i.e. <100% chronic population adjusted doses (cPAD))**; therefore, a partially refined chronic dietary assessment was performed with use of anticipated residues (ARs) from field trial data and processing factors where applicable, from the previous risk assessment (D248827, S. Levy, 20/FEB/2001). The refined Tier 2 chronic dietary risk assessment for fipronil shows that for all included commodities, the chronic dietary risk estimates **are below HED's level of concern (<100% cPAD).** The chronic dietary risk estimate for the highest reported exposed population subgroup, children 1-2 years, is 94% of the cPAD.

Cancer

The HED Cancer Peer Review Committee (document dated 7/18/97) classified fipronil as a Group C chemical (possible human carcinogen). The HIARC determined that cancer dietary risk concerns due to long-term consumption of fipronil residues are adequately addressed by the chronic dietary exposure analysis using the RfD; therefore, a separate cancer dietary exposure analysis was not performed.

Water Contribution

The Environmental Fate and Effects Division (EFED) provided environmental fate and a comparative drinking water assessment for the proposed and registered uses of fipronil assuming 100% of fipronil and its metabolites are available for degradation, runoff, and leaching. The drinking water assessment was based on screening level models because available monitoring data represent cancelled fipronil uses (i.e., rice) or are not targeted to all fipronil use areas (D322415, D319940, D328892, J. Hetrick, 26/JUN/2006). This dietary risk analysis incorporated water concentration estimates from the proposed onion seed treatment scenario for

both the acute and chronic dietary analysis. The acute water concentration, 0.002654 ppm, was determined by adding the 1 in 10 year peak concentrations for fipronil and its metabolites, while the chronic water concentration, 0.000167 ppm, was determined by adding the 1 in 10 year average concentrations.

I. Introduction

Dietary Exposure

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose. This is the population adjusted dose (PAD), which HED has concluded will result in no unreasonable adverse health effects. The PAD is the Reference Dose (RfD) divided by the special FQPA Safety Factor. Dietary risk is expressed as a percentage of the PAD. For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. References which discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide", 6/21/2000, web link: http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf ; or see SOP 99.6 (8/20/99).

The most recent dietary risk assessment for fipronil was conducted by Breann Hanson (D324295, B. Hanson, 20/DEC/2005) for its use on onion seed (dry bulb), shallot seed (dry bulb), potatoes and sweet potatoes. The purpose of this memo is to report the results of a dietary exposure analysis for fipronil for use on onion seed (dry bulb), shallot seed (dry bulb) and the tuberous and corm vegetables crop group 1C based on revised water numbers (D322415, D319940, D328892, J. Hetrick, 26/JUN/2006).

II. Residue Information

In this analysis the acute and chronic dietary exposure and risk estimates resulting from food intake were determined for the general U.S. population and various population subgroups resulting from the addition of onion seed (dry bulb), shallot seed (dry bulb) and the tuberous and corm vegetables crop group 1C to the commodity residue list for fipronil.

Tolerances for residues of fipronil (+ its 2 metabolites and 1 photodegradate) have been established (40 CFR. §180.517(a)) for the following commodities: rice grain (0.04 ppm); rice straw (0.10 ppm); corn, field, grain (0.02 ppm); corn, field, stover (0.30 ppm); corn, field, forage (0.15 ppm); eggs (0.03 ppm); fat of cattle, goat, horse, and sheep (0.40 ppm); hog fat (0.04 ppm); hog liver (0.02 ppm); hog meat (0.01 ppm); hog meat byproducts (except liver) (0.01 ppm); liver of cattle, goat, horse, and sheep (0.10 ppm); meat byproducts of cattle, goat, horse, and sheep (except liver) (0.04 ppm); meat of cattle, goat, horse, and sheep (0.04 ppm); milk, fat (reflecting 0.05 ppm in whole milk) (1.50 ppm); poultry fat (0.05 ppm); poultry meat (0.02 ppm); and poultry meat byproducts (0.02 ppm). Recent tolerances for residues have been added for turnip

(1.0 ppm) and rutabaga (1.0 ppm).

The DEEM-FCID™ acute analysis was performed assuming tolerance level residues and that 100% of each crop was treated for onions and shallots at 0.03 ppm, tuberous and corm vegetables at 0.03 ppm and also included a water (acute) modeled concentration of 0.002654 ppm. The DEEM (ver. 7.81) processing factors were used for all commodities except for potato, flakes and potato, chips, both of which are dried potato commodities. These commodities are usually given the default processing factor of 6.5. HED determined, via residue data, that the processing factors for these commodities are actually <1. Using a processing factor of 1 allows for a more conservative estimate of the acute dietary exposure and risk.

The DEEM-FCID™ chronic analysis was performed using ARs from field trial data and processing factors from the last fipronil dietary analysis (D248827, Levy, 02/20/2001), as noted in Table 1, and also included a water (chronic) modeled concentration of 0.000167 ppm. New AR data for potato and sweet potato commodities, as well as processing factors, were provided by HED (D313293, M. Sahafeyan, 05/AUG/2005).

The following ARs were used in the Tier 2 chronic analysis for the expected residues of fipronil and its metabolites. For crop group 1C, the tolerance level of 0.03 ppm and 100% CT data were used for the analysis except for potatoes (tuber) (0.028 ppm), potatoes (chip) (0.023 ppm), potatoes (flakes) (0.026 ppm), potatoes (wet peels) (0.390 ppm) and sweet potatoes (0.028 ppm).

Commodity	AR
Onion (dry bulb), shallot (dry bulb)	0.030 ppm[1]
Potatoes (tuber)	0.028 ppm[2]
Potatoes (chip)	0.023 ppm[3]
Potatoes (flakes)	0.026 ppm[3]
Potatoes (wet peels)	0.390 ppm[3]
Sweet Potatoes	0.028 ppm[2]

[1] Recommended tolerance level (D313293, M. Sahafeyan, 05/AUG/2005)
[2] Highest residue found in potato trials (D313293, M. Sahafeyan, 05/AUG/2005)
[3] Potato residue data (MRID # 44262835, M. Sahafeyan, 06/JUL/2005)

Table 1. Exisiting Fipronil and Metabolite ARs and Processing Factors used for Chronic Dietary Risk Assessment.

Commodity	AR to use in Chronic Dietary Exposure Analysis (ppm)	Processing Factor
Corn Grain [1] **Includes processed commodities**	0.015	1 x
Rice Grain [2] **Includes processed commodities Excludes wild rice**	0.020	1 x
Wheat Grain [3]	0.005	N/A
Meat [4]	0.00094	
Liver [4]	0.0025	
Meat by-products (except liver) [4]	0.00060	
Fat [4]	0.0087	
Milk Fat [5]	0.0029	
Hog Meat	0.00031	
Hog Liver	0.00083	
Hog Meat by-products (except liver)	0.00020	
Hog Fat	0.0029	
Poultry meat	0.00018	
Poultry meat by-products	0.00084	
Poultry fat	0.0023	
Eggs	0.0013	

1 Since residues do not concentrate in processed commodities of corn, the AR of 0.015 ppm should be used for the RAC and processed commodities in the DEEM™ analysis (i.e. corn oil, meal, etc.) except corn sugar for which processing data are not available.

2 Since residues do not concentrate in processed commodities of rice, the AR of 0.02 ppm should be used for the RAC and processed commodities in the DEEM™ analysis (i.e. flour, etc.).

3 Processing data are not available for wheat RACs at this time. The AR of 0.005 ppm should be used for the RAC and processed commodities in the DEEM™ analysis (i.e. wheat

bran, etc.).

[4] These ARs should also be used for meat, fat, and meat by-products of cattle, goats, horses, and sheep in the DEEM™ analysis.

[5] All residues in milk are assumed to concentrate in fat, a value of 0 ppm should be used for other milk fractions.

There are no proposed uses for fipronil on wheat. The proposed tolerances for wheat RACs (0.005 ppm) are for inadvertent residues resulting from uptake by rotational crops. Therefore the wheat, grain tolerance (0.005 ppm) was used for all wheat commodities in both the acute and chronic assessments.

With the proposed tolerance on potato and potato wet peel and the withdrawal of cotton tolerance petition, HED recalculated the maximum theoretical dietary burden (MTDB) for animal commodities based upon the addition of potato culls and processed potato waste to the livestock diet. Estimates indicated that increases in theoretical dietary burden for livestock are not expected from withdrawal of cotton feed items and addition of potato feed items (culls and processed waste). Thus, current tolerances on livestock are maintained.

The use of fipronil in/on cotton has been withdrawn by the registrant and so for the purpose of this dietary analysis the tolerance for cotton has been removed. The use of fipronil on rice is an overseas use only yet tolerances were included into both the acute and chronic dietary analyses.

This analysis incorporates all current, pending, and proposed tolerances for fipronil as of August 1, 2006.

III. DEEM-FCID™ Program and Consumption Information

A fipronil acute and chronic dietary exposure assessment was conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03), which incorporates consumption data from USDA's Continuing Surveys of Food Intakes by Individuals (CSFII), 1994-1996 and 1998. The 1994-96, 98 data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g. apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. Consumption data are averaged for the entire U.S. population and within population subgroups for chronic exposure assessment, but are retained as individual consumption events for acute exposure assessment.

For acute exposure assessments, individual one-day food consumption data are used on an individual-by-individual basis. The reported consumption amounts of each food item can be multiplied by a residue point estimate and summed to obtain a total daily pesticide exposure for a deterministic (Tier 1 or Tier 2) exposure assessment, or "matched" in multiple random pairings

with residue values and then summed in a probabilistic (Tier 3/4) assessment. The resulting distribution of exposures is expressed as a percentage of the aPAD on both a user (i.e., those who reported eating relevant commodities/food forms) and a per-capita (i.e., those who reported eating the relevant commodities as well as those who did not) basis. In accordance with HED policy, per capita exposure and risk are reported for all tiers of analysis. However, for tiers 1 and 2, significant differences in user vs. per capita exposure and risk are identified and noted in the risk assessment.

For chronic exposure and risk assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form. The resulting residue consumption estimate for each food/food form is summed with the residue consumption estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

IV. Toxicological Information

Table 2. Summary of Toxicology Endpoint Selections for Fipronil [a]

Exposure Scenario	Dose Used in Risk Assessment, UF	Special FQPA SF* and Level of Concern for Risk Assessment	Study and Toxicological Effects
Acute Dietary all populations including infants and children	NOAEL=2.5 mg/kg UF = 100 Acute RfD = 0.025 mg/kg/day	FQPA SF = 1x **aPAD** = acute RfD / FQPA SF = 0.025 mg/kg/day	Acute neurotoxicity LOAEL = 7.0 mg/kg based on decreased hind leg splay in males at 7 hours.
Chronic Dietary all populations	NOAEL= 0.019 mg/kg/day UF = 100 Chronic RfD = 0.0002 mg/kg/day	FQPA SF = 1x **cPAD** = chronic RfD / FQPA SF **0.0002 = mg/kg/day**	Chronic/onco rat study LOAEL = 0.059 mg/kg/day based on increased incidence of seizures and death, alterations in clinical chemistry (protein) and TSH, T4.
Cancer (oral, dermal, inhalation)	Group C - possible human carcinogen	Use chronic RfD to estimate human risk	Increases in thyroid follicular cell tumors with fipronil (male/female)

[a] UF = uncertainty factor; FQPA SF = FQPA safety factor; NOAEL = no observed adverse effect level; LOAEL = lowest observed adverse effect level; PAD = population adjusted dose (a = acute, c = chronic); RfD = reference dose.

Based on the hazard and exposure data, the HED Food Quality Protection Act (FQPA) Safety Factor Committee (SFC) determined that the additional **10x factor** for enhanced sensitivity to infants and children (as required by FQPA) should be **removed** (i.e., reduced to 1x) for fipronil and its photodegradate, MB46513 (FQPA Document, HED Doc. No. 012619, 5/12/98). Removing the 10x FQPA SF resulted in the aPAD of 0.025 mg/kg for acute dietary risk assessment and cPAD of 0.0002 mg/kg/day for chronic dietary risk assessment. A PAD is a reference dose (RfD) modified by the FQPA SF (RfD/FQPA SF = PAD).

V. Results/Discussion & Conclusions

As stated above, for acute and chronic assessments, HED is concerned when dietary risk exceeds 100% of the PAD. The DEEM-FCID™ analyses estimate the dietary exposure for the U.S. population and various population subgroups for both the acute and chronic dietary exposures. Results are reported in Table 3 for acute dietary exposures for the general U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, adults 20-49, and adults 50+ years, highlighting the results for the highest exposure group, children 1-2 years (25% aPAD), at the 95th percentile. The results reported in Table 4 are for chronic dietary exposures for the U.S. population and the same 8 population subgroups noted above. A full listing of the residue information used in these analyses is given in Attachments 1 through 4.

Results of Acute Dietary Exposure Analysis

The tier 1 acute dietary risk assessment results are reported at the 95th, 99th and 99.9th percentiles. The exposure assessment incorporated 100% CT and tolerance level residue assumptions. The result for the highest exposure group, children 1-2 years (25% aPAD), at the 95th percentile is highlighted in Table 3.

Table 3. Results of Acute Dietary Exposure Analysis

Population Subgroup	aPAD (mg/kg /day)	95th Percentile		99th Percentile		99.9th Percentile	
		Exposure (mg/kg /day)	% aPAD	Exposure (mg/kg /day)	% aPAD	Exposure (mg/kg /day)	% aPAD
General U.S. Population	0.025	0.002345	9	.004229	17	.007422	30
All Infants	0.025	0.003214	13	0.008053	32	0.010955	44
Children 1-2 years old	0.025	0.006194	**25**	0.008337	33	0.012218	49
Children 3-5 years old	0.025	0.004411	18	0.006105	24	0.010139	41
Children 6-12 years old	0.025	0.002878	12	0.004012	16	0.006860	27
Youth 13-19years old	0.025	0.001810	7	0.002970	12	0.005423	22
Adults 20-49 years old	0.025	0.001343	5	0.002364	9	0.003430	14
Females 13-49 years old	0.025	0.001280	5	0.001935	8	0.003462	14
Adults 50+ years old	0.025	0.001100	4	0.001945	8	0.004062	16

Results of Chronic Dietary Exposure Analysis

The Tier 2 chronic dietary risk assessment was conducted for fipronil food uses and drinking water. A partially refined analysis was performed using ARs and processing factors where applicable. The result for the highest exposure group, children 1-2 years (94% aPAD), is highlighted in Table 4.

Table 4. Results of Chronic Dietary Exposure Analysis

Population Subgroup	cPAD (mg/kg/day)	Exposure (mg/kg/day)	% cPAD
General U.S. Population	0.0002	0.000092	46
All Infants (< 1 year old)	0.0002	0.000116	58
Children 1-2 years old	0.0002	0.000188	**94**
Children 3-5 years old	0.0002	0.000182	91
Children 6-12 years old	0.0002	0.000127	64
Youth 13-19 years old	0.0002	0.000095	48
Adults 20-49 years old	0.0002	0.000076	38
Females 13-49 years old	0.0002	0.000071	36
Adults 50+ years old	0.0002	0.000077	39

VI. List of Attachments

Attachment 1- Results of Tier 1 Acute Dietary Analysis of Fipronil
Attachment 2- Residue Inputs for Tier 1 Acute Dietary Assessment of Fipronil
Attachment 3- Results of Tier 2 Chronic Dietary Analysis for Fipronil
Attachment 4- Residue Inputs for Tier 2 Chronic Dietary Assessment of Fipronil

Attachment 1- Results of Tier 1 Acute Dietary Analysis of Fipronil

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U.S. Environmental Protection Agency                                    Ver. 2.02
DEEM-FCID ACUTE Analysis for FIPRONIL                                  (1994-98
data)
Residue file: 129121a(aug06) (group1C).R98        Adjustment factor #2 NOT
used.
Analysis Date: 08-11-2006/06:50:05    Residue file dated: 08-11-
2006/06:49:02/8
NOEL (Acute) =   2.500000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
Run Comment: "THIS R98 FILE WAS GENERATED RS7toR98 VERSION 1.1.2. COMMENT FROM
 THE SOURCE RS7 FILE: Acute - Tier 1"
================================================================================
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Summary calculations (per capita):

      95th Percentile              99th Percentile              99.9th
Percentile
Exposure  % aRfD     MOE     Exposure  % aRfD     MOE     Exposure  % aRfD   MOE
---------- ------- -------- ---------- ------- -------- ---------- ------- ---
-----
U.S. Population:
  0.002345    9.38    1065    0.004229   16.92     591    0.007431   29.72 336

All infants:
  0.003215   12.86     777    0.008056   32.22     310    0.010958   43.83 228

Children 1-2 yrs:
  0.006195   24.78     403    0.008339   33.36     299    0.012220   48.88 204

Children 3-5 yrs:
  0.004413   17.65     566    0.006098   24.39     409    0.010141   40.56 246

Children 6-12 yrs:
  0.002878   11.51     868    0.004013   16.05     622    0.006862   27.45 364

Youth 13-19 yrs:
  0.001811    7.24    1380    0.002971   11.88     841    0.005425   21.70 460

Adults 20-49 yrs:
  0.001343    5.37    1861    0.002362    9.45    1058    0.003431   13.72 728

Adults 50+ yrs:
  0.001100    4.40    2271    0.001945    7.78    1285    0.004063   16.25 615

Females 13-49 yrs:
  0.001280    5.12    1953    0.001935    7.74    1291    0.003463   13.85 721
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Attachment 2- Residue Inputs for Tier 1 Acute Dietary Assessment of Fipronil

U.S. Environmental Protection Agency Ver. 2.02
DEEM-FCID Acute analysis for FIPRONIL
Residue file name: E:\Fipronil July 2006\129121a(aug06) (group1C).R98
Analysis Date 08-11-2006 Residue file dated: 08-11-2006/06:49:02/8
Reference dose: aRfD = 0.025 mg/kg bw/day NOEL = 2.5 mg/kg bw/day
Comment: THIS R98 FILE WAS GENERATED RS7toR98 VERSION 1.1.2. COMMENT FROM THE SOURCE RS7 FILE: Acute - Tier 1

EPA Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	#2	Comment
01030150	1CD	Arrowroot, flour	0.030000	1.000	1.000	
01030151	1CD	Arrowroot, flour-babyfood	0.030000	1.000	1.000	
01030170	1CD	Artichoke, Jerusalem	0.030000	1.000	1.000	
21000440	M	Beef, meat	0.040000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.040000	1.000	1.000	
21000450	M	Beef, meat, dried	0.040000	1.920	1.000	
21000460	M	Beef, meat byproducts	0.040000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	0.040000	1.000	1.000	
21000470	M	Beef, fat	0.400000	1.000	1.000	
21000471	M	Beef,fat-babyfood	0.400000	1.000	1.000	
21000480	M	Beef, kidney	0.040000	1.000	1.000	
21000490	M	Beef, liver	0.100000	1.000	1.000	
21000491	M	Beef, liver-babyfood	0.100000	1.000	1.000	
01030820	1CD	Cassava	0.030000	1.000	1.000	
01030821	1CD	Cassava-babyfood	0.030000	1.000	1.000	
40000930	P	Chicken, meat	0.020000	1.000	1.000	
40000931	P	Chicken, meat-babyfood	0.020000	1.000	1.000	
40000940	P	Chicken, liver	0.020000	1.000	1.000	
40000950	P	Chicken, meat byproducts	0.020000	1.000	1.000	
40000951	P	Chicken, meat byproducts-babyfoo	0.020000	1.000	1.000	
40000960	P	Chicken, fat	0.050000	1.000	1.000	
40000961	P	Chicken, fat-babyfood	0.050000	1.000	1.000	
40000970	P	Chicken, skin	0.050000	1.000	1.000	
40000971	P	Chicken, skin-babyfood	0.050000	1.000	1.000	
15001200	15	Corn, field, flour	0.020000	1.000	1.000	
15001201	15	Corn, field, flour-babyfood	0.020000	1.000	1.000	
15001210	15	Corn, field, meal	0.020000	1.000	1.000	
15001211	15	Corn, field, meal-babyfood	0.020000	1.000	1.000	
15001220	15	Corn, field, bran	0.020000	1.000	1.000	
15001230	15	Corn, field, starch	0.020000	1.000	1.000	
15001231	15	Corn, field, starch-babyfood	0.020000	1.000	1.000	
15001240	15	Corn, field, syrup	0.020000	1.500	1.000	
15001241	15	Corn, field, syrup-babyfood	0.020000	1.500	1.000	
15001250	15	Corn, field, oil	0.020000	1.000	1.000	
15001251	15	Corn, field, oil-babyfood	0.020000	1.000	1.000	
01031390	1CD	Dasheen, corm	0.030000	1.000	1.000	
70001450	P	Egg, whole	0.030000	1.000	1.000	
70001451	P	Egg, whole-babyfood	0.030000	1.000	1.000	
70001460	P	Egg, white	0.030000	1.000	1.000	
70001461	P	Egg, white (solids)-babyfood	0.030000	1.000	1.000	
70001470	P	Egg, yolk	0.030000	1.000	1.000	

70001471	P	Egg, yolk-babyfood	0.030000	1.000	1.000
01031660	1CD	Ginger	0.030000	1.000	1.000
01031661	1CD	Ginger-babyfood	0.030000	1.000	1.000
01031670	1CD	Ginger, dried	0.030000	1.000	1.000
23001690	M	Goat, meat	0.040000	1.000	1.000
23001700	M	Goat, meat byproducts	0.040000	1.000	1.000
23001710	M	Goat, fat	0.400000	1.000	1.000
23001720	M	Goat, kidney	0.040000	1.000	1.000
23001730	M	Goat, liver	0.100000	1.000	1.000
24001890	M	Horse, meat	0.040000	1.000	1.000
27002220	D	Milk, fat	1.500000	1.000	1.000
27002221	D	Milk, fat - baby food/infant for	1.500000	1.000	1.000
03002370	3	Onion, dry bulb	0.030000	1.000	1.000
03002371	3	Onion, dry bulb-babyfood	0.030000	1.000	1.000
03002380	3	Onion, dry bulb, dried	0.030000	1.000	1.000
03002381	3	Onion, dry bulb, dried-babyfood	0.030000	1.000	1.000
25002900	M	Pork, meat	0.010000	1.000	1.000
25002901	M	Pork, meat-babyfood	0.010000	1.000	1.000
25002910	M	Pork, skin	0.040000	1.000	1.000
25002920	M	Pork, meat byproducts	0.010000	1.000	1.000
25002921	M	Pork, meat byproducts-babyfood	0.010000	1.000	1.000
25002930	M	Pork, fat	0.040000	1.000	1.000
25002931	M	Pork, fat-babyfood	0.040000	1.000	1.000
25002940	M	Pork, kidney	0.010000	1.000	1.000
25002950	M	Pork, liver	0.020000	1.000	1.000
01032960	1C	Potato, chips	0.030000	1.000	1.000
01032970	1C	Potato, dry (granules/ flakes)	0.030000	1.000	1.000
01032971	1C	Potato, dry (granules/ flakes)-b	0.030000	1.000	1.000
01032980	1C	Potato, flour	0.030000	1.000	1.000
01032981	1C	Potato, flour-babyfood	0.030000	1.000	1.000
01032990	1C	Potato, tuber, w/peel	0.030000	1.000	1.000
01032991	1C	Potato, tuber, w/peel-babyfood	0.030000	1.000	1.000
01033000	1C	Potato, tuber, w/o peel	0.030000	1.000	1.000
01033001	1C	Potato, tuber, w/o peel-babyfood	0.030000	1.000	1.000
60003010	P	Poultry, other, meat	0.020000	1.000	1.000
60003020	P	Poultry, other, liver	0.020000	1.000	1.000
60003030	P	Poultry, other, meat byproducts	0.020000	1.000	1.000
60003040	P	Poultry, other, fat	0.050000	1.000	1.000
60003050	P	Poultry, other, skin	0.050000	1.000	1.000
15003230	15	Rice, white	0.040000	1.000	1.000
15003231	15	Rice, white-babyfood	0.040000	1.000	1.000
15003240	15	Rice, brown	0.040000	1.000	1.000
15003241	15	Rice, brown-babyfood	0.040000	1.000	1.000
15003250	15	Rice, flour	0.040000	1.000	1.000
15003251	15	Rice, flour-babyfood	0.040000	1.000	1.000
15003260	15	Rice, bran	0.040000	1.000	1.000
15003261	15	Rice, bran-babyfood	0.040000	1.000	1.000
01013270	1AB	Rutabaga	1.000000	1.000	1.000
03003380	3	Shallot	0.030000	1.000	1.000
26003390	M	Sheep, meat	0.040000	1.000	1.000
26003391	M	Sheep, meat-babyfood	0.040000	1.000	1.000
26003400	M	Sheep, meat byproducts	0.040000	1.000	1.000
26003410	M	Sheep, fat	0.400000	1.000	1.000
26003411	M	Sheep, fat-babyfood	0.400000	1.000	1.000
26003420	M	Sheep, kidney	0.040000	1.000	1.000
26003430	M	Sheep, liver	0.100000	1.000	1.000
01033660	1CD	Sweet potato	0.030000	1.000	1.000
01033661	1CD	Sweet potato-babyfood	0.030000	1.000	1.000

01033710	1CD	Tanier, corm	0.030000	1.000	1.000
15003810	15	Triticale, flour	0.005000	1.000	1.000
15003811	15	Triticale, flour-babyfood	0.005000	1.000	1.000
50003820	P	Turkey, meat	0.020000	1.000	1.000
50003821	P	Turkey, meat-babyfood	0.020000	1.000	1.000
50003830	P	Turkey, liver	0.020000	1.000	1.000
50003831	P	Turkey, liver-babyfood	0.020000	1.000	1.000
50003840	P	Turkey, meat byproducts	0.020000	1.000	1.000
50003841	P	Turkey, meat byproducts-babyfood	0.020000	1.000	1.000
50003850	P	Turkey, fat	0.050000	1.000	1.000
50003851	P	Turkey, fat-babyfood	0.050000	1.000	1.000
50003860	P	Turkey, skin	0.050000	1.000	1.000
50003861	P	Turkey, skin-babyfood	0.050000	1.000	1.000
01033870	1CD	Turmeric	0.030000	1.000	1.000
01013880	1AB	Turnip, roots	1.000000	1.000	1.000
05023890	5E	Turnip, greens	1.000000	1.000	1.000
86010000	O	Water, direct, all sources	0.002654	1.000	1.000
86020000	O	Water, indirect, all sources	0.002654	1.000	1.000
15004010	15	Wheat, grain	0.005000	1.000	1.000
15004011	15	Wheat, grain-babyfood	0.005000	1.000	1.000
15004020	15	Wheat, flour	0.005000	1.000	1.000
15004021	15	Wheat, flour-babyfood	0.005000	1.000	1.000
15004030	15	Wheat, germ	0.005000	1.000	1.000
15004040	15	Wheat, bran	0.005000	1.000	1.000
01034060	1CD	Yam, true	0.030000	1.000	1.000
01034070	1CD	Yam bean	0.030000	1.000	1.000

Attachment 3- Results of Tier 2 Chronic Dietary Analysis for Fipronil

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for FIPRONIL (1994-98 data)
Residue file name: E:\Fipronil July 2006\129121cGroup1C(aug06(2))no%CT.R98
Adjustment factor #2 NOT used.
Analysis Date 08-11-2006/07:54:50 Residue file dated: 08-11-2006/07:49:49/8
Reference dose (RfD, Chronic) = .0002 mg/kg bw/day
COMMENT 1: THIS R98 FILE WAS GENERATED RS7toR98 VERSION 1.1.2. COMMENT FROM THE SOURCE RS7 FILE: Chronic

Total exposure by population subgroup

Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Percent of Rfd
U.S. Population (total)	0.000092	46.2%
U.S. Population (spring season)	0.000089	44.4%
U.S. Population (summer season)	0.000089	44.6%
U.S. Population (autumn season)	0.000099	49.3%
U.S. Population (winter season)	0.000093	46.3%
Northeast region	0.000083	41.3%
Midwest region	0.000093	46.7%
Southern region	0.000101	50.4%
Western region	0.000087	43.4%
Hispanics	0.000097	48.5%
Non-hispanic whites	0.000085	42.7%
Non-hispanic blacks	0.000124	62.2%
Non-hisp/non-white/non-black	0.000104	52.1%
All infants (< 1 year)	0.000116	57.9%
Nursing infants	0.000049	24.5%
Non-nursing infants	0.000141	70.6%
Children 1-6 yrs	0.000180	89.8%
Children 7-12 yrs	0.000122	60.8%
Females 13-19 (not preg or nursing)	0.000083	41.3%
Females 20+ (not preg or nursing)	0.000071	35.6%
Females 13-50 yrs	0.000075	37.6%
Females 13- (preg/not nursing)	0.000070	35.0%
Females 13- (nursing)	0.000075	37.3%
Males 13-19 yrs	0.000108	54.0%
Males 20+ yrs	0.000082	40.8%
Seniors 55-	0.000081	40.4%
Children 1-2 yrs	0.000188	93.9%
Children 3-5 yrs	0.000182	90.8%

Children 6-12 yrs	0.000127	63.5%
Youth 13-19 yrs	0.000095	47.7%
Adults 20-49 yrs	0.000076	37.9%
Adults 50+ yrs	0.000077	38.5%
Females 13-49 yrs	0.000071	35.5%

Attachment 4- Residue Inputs for Tier 2 Chronic Dietary Assessment of Fipronil

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for FIPRONIL 1994-98 data
Residue file: E:\Fipronil July 2006\129121cGroup1C(aug06(2))no%CT.R98
Adjust. #2 NOT used
Analysis Date 08-11-2006 Residue file dated: 08-11-2006/07:49:49/8
Reference dose (RfD) = 0.0002 mg/kg bw/day
Comment:THIS R98 FILE WAS GENERATED RS7toR98 VERSION 1.1.2. COMMENT FROM THE SOURCE RS7 FILE: Chronic

Food Crop EPA Code	Crp	Food Name	Residue (ppm)	Adj.Factors #1	#2	Comment
01030150	1CD	Arrowroot, flour	0.030000	1.000	1.000	
01030151	1CD	Arrowroot, flour-babyfood	0.030000	1.000	1.000	
01030170	1CD	Artichoke, Jerusalem	0.030000	1.000	1.000	
21000440	M	Beef, meat	0.000940	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.000940	1.000	1.000	
21000450	M	Beef, meat, dried	0.000940	1.920	1.000	
21000460	M	Beef, meat byproducts	0.000600	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	0.000600	1.000	1.000	
21000470	M	Beef, fat	0.008700	1.000	1.000	
21000471	M	Beef,fat-babyfood	0.008700	1.000	1.000	
21000480	M	Beef, kidney	0.000600	1.000	1.000	
21000490	M	Beef, liver	0.002500	1.000	1.000	
21000491	M	Beef, liver-babyfood	0.002500	1.000	1.000	
01030820	1CD	Cassava	0.030000	1.000	1.000	
01030821	1CD	Cassava-babyfood	0.030000	1.000	1.000	
40000930	P	Chicken, meat	0.000180	1.000	1.000	
40000931	P	Chicken, meat-babyfood	0.000180	1.000	1.000	
40000940	P	Chicken, liver	0.000840	1.000	1.000	
40000950	P	Chicken, meat byproducts	0.000840	1.000	1.000	
40000951	P	Chicken, meat byproducts-babyfoo	0.000840	1.000	1.000	
40000960	P	Chicken, fat	0.002300	1.000	1.000	
40000961	P	Chicken, fat-babyfood	0.002300	1.000	1.000	
40000970	P	Chicken, skin	0.002300	1.000	1.000	
40000971	P	Chicken, skin-babyfood	0.002300	1.000	1.000	
15001200	15	Corn, field, flour	0.015000	1.000	1.000	
15001201	15	Corn, field, flour-babyfood	0.015000	1.000	1.000	
15001210	15	Corn, field, meal	0.015000	1.000	1.000	
15001211	15	Corn, field, meal-babyfood	0.015000	1.000	1.000	
15001220	15	Corn, field, bran	0.015000	1.000	1.000	
15001230	15	Corn, field, starch	0.015000	1.000	1.000	
15001231	15	Corn, field, starch-babyfood	0.015000	1.000	1.000	
15001240	15	Corn, field, syrup	0.015000	1.500	1.000	
15001241	15	Corn, field, syrup-babyfood	0.015000	1.500	1.000	
15001250	15	Corn, field, oil	0.015000	1.000	1.000	
15001251	15	Corn, field, oil-babyfood	0.015000	1.000	1.000	
01031390	1CD	Dasheen, corm	0.030000	1.000	1.000	
70001450	P	Egg, whole	0.001300	1.000	1.000	
70001451	P	Egg, whole-babyfood	0.001300	1.000	1.000	
70001460	P	Egg, white	0.001300	1.000	1.000	

70001461	P	Egg, white (solids)-babyfood	0.001300	1.000	1.000
70001470	P	Egg, yolk	0.001300	1.000	1.000
70001471	P	Egg, yolk-babyfood	0.001300	1.000	1.000
01031660	1CD	Ginger	0.030000	1.000	1.000
01031661	1CD	Ginger-babyfood	0.030000	1.000	1.000
01031670	1CD	Ginger, dried	0.030000	1.000	1.000
23001690	M	Goat, meat	0.000940	1.000	1.000
23001700	M	Goat, meat byproducts	0.000940	1.000	1.000
23001710	M	Goat, fat	0.008700	1.000	1.000
23001720	M	Goat, kidney	0.000600	1.000	1.000
23001730	M	Goat, liver	0.002500	1.000	1.000
24001890	M	Horse, meat	0.000940	1.000	1.000
27002220	D	Milk, fat	0.002900	1.000	1.000
27002221	D	Milk, fat - baby food/infant for	0.002900	1.000	1.000
03002370	3	Onion, dry bulb	0.030000	1.000	1.000
03002371	3	Onion, dry bulb-babyfood	0.030000	1.000	1.000
03002380	3	Onion, dry bulb, dried	0.030000	9.000	1.000
03002381	3	Onion, dry bulb, dried-babyfood	0.030000	9.000	1.000
25002900	M	Pork, meat	0.000310	1.000	1.000
25002901	M	Pork, meat-babyfood	0.000310	1.000	1.000
25002910	M	Pork, skin	0.002900	1.000	1.000
25002920	M	Pork, meat byproducts	0.000200	1.000	1.000
25002921	M	Pork, meat byproducts-babyfood	0.000200	1.000	1.000
25002930	M	Pork, fat	0.002900	1.000	1.000
25002931	M	Pork, fat-babyfood	0.002900	1.000	1.000
25002940	M	Pork, kidney	0.000200	1.000	1.000
25002950	M	Pork, liver	0.000830	1.000	1.000
01032960	1C	Potato, chips	0.023000	0.400	1.000
01032970	1C	Potato, dry (granules/ flakes)	0.026000	0.470	1.000
01032971	1C	Potato, dry (granules/ flakes)-b	0.026000	0.470	1.000
01032980	1C	Potato, flour	0.028000	1.000	1.000
01032981	1C	Potato, flour-babyfood	0.028000	1.000	1.000
01032990	1C	Potato, tuber, w/peel	0.028000	1.000	1.000
01032991	1C	Potato, tuber, w/peel-babyfood	0.028000	1.000	1.000
01033000	1C	Potato, tuber, w/o peel	0.028000	1.000	1.000
01033001	1C	Potato, tuber, w/o peel-babyfood	0.028000	1.000	1.000
60003010	P	Poultry, other, meat	0.000180	1.000	1.000
60003020	P	Poultry, other, liver	0.000840	1.000	1.000
60003030	P	Poultry, other, meat byproducts	0.000840	1.000	1.000
60003040	P	Poultry, other, fat	0.002300	1.000	1.000
60003050	P	Poultry, other, skin	0.002300	1.000	1.000
15003230	15	Rice, white	0.020000	1.000	1.000
15003231	15	Rice, white-babyfood	0.020000	1.000	1.000
15003240	15	Rice, brown	0.020000	1.000	1.000
15003241	15	Rice, brown-babyfood	0.020000	1.000	1.000
15003250	15	Rice, flour	0.020000	1.000	1.000
15003251	15	Rice, flour-babyfood	0.020000	1.000	1.000
15003260	15	Rice, bran	0.020000	1.000	1.000
15003261	15	Rice, bran-babyfood	0.020000	1.000	1.000
01013270	1AB	Rutabaga	1.000000	1.000	1.000
03003380	3	Shallot	0.030000	1.000	1.000
26003390	M	Sheep, meat	0.000940	1.000	1.000
26003391	M	Sheep, meat-babyfood	0.000940	1.000	1.000
26003400	M	Sheep, meat byproducts	0.000600	1.000	1.000
26003410	M	Sheep, fat	0.008700	1.000	1.000
26003411	M	Sheep, fat-babyfood	0.008700	1.000	1.000
26003420	M	Sheep, kidney	0.000600	1.000	1.000
26003430	M	Sheep, liver	0.002500	1.000	1.000

01033660	1CD	Sweet potato	0.028000	1.000	1.000
01033661	1CD	Sweet potato-babyfood	0.028000	1.000	1.000
01033710	1CD	Tanier, corm	0.028000	1.000	1.000
15003810	15	Triticale, flour	0.005000	1.000	1.000
15003811	15	Triticale, flour-babyfood	0.005000	1.000	1.000
50003820	P	Turkey, meat	0.000180	1.000	1.000
50003821	P	Turkey, meat-babyfood	0.000180	1.000	1.000
50003830	P	Turkey, liver	0.000840	1.000	1.000
50003831	P	Turkey, liver-babyfood	0.000840	1.000	1.000
50003840	P	Turkey, meat byproducts	0.000840	1.000	1.000
50003841	P	Turkey, meat byproducts-babyfood	0.000840	1.000	1.000
50003850	P	Turkey, fat	0.002300	1.000	1.000
50003851	P	Turkey, fat-babyfood	0.002300	1.000	1.000
50003860	P	Turkey, skin	0.002300	1.000	1.000
50003861	P	Turkey, skin-babyfood	0.002300	1.000	1.000
01033870	1CD	Turmeric	0.030000	1.000	1.000
01013880	1AB	Turnip, roots	1.000000	1.000	1.000
05023890	5B	Turnip, greens	1.000000	1.000	1.000
86010000	O	Water, direct, all sources	0.000167	1.000	1.000
86020000	O	Water, indirect, all sources	0.000167	1.000	1.000
15004010	15	Wheat, grain	0.005000	1.000	1.000
15004011	15	Wheat, grain-babyfood	0.005000	1.000	1.000
15004020	15	Wheat, flour	0.005000	1.000	1.000
15004021	15	Wheat, flour-babyfood	0.005000	1.000	1.000
15004030	15	Wheat, germ	0.005000	1.000	1.000
15004040	15	Wheat, bran	0.005000	1.000	1.000
01034060	1CD	Yam, true	0.030000	1.000	1.000
01034070	1CD	Yam bean	0.030000	1.000	1.000

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